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Review of National Emission Standards for Mercury (Final Environmental Impact Statement)

(U.S.) Environmental Protection Agency
Research Triangle Park, NC

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16. ABSTRACT

This report summarizes public comments that were made on the proposed revisions to the national emission standards for the hazardous air pollutant mercury. The document also provides the Environmental Protection Agency's responses to those comments. Changes made to the final revisions (since proposal) are briefly described.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
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Air

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Review of National Emission Standards for Mercury

Final
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NESHAP

EPA-450/3-84-014b

Review of National Emission Standards for Mercury

Emission Standards and Engineering Division

Office of Air and Radiation
Office of Air Quality Planning and Standards
U.S. Environmental Protection Agency
Research Triangle Park NC 27711

March 1987

1a

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ENVIRONMENTAL PROTECTION AGENCY

Background Information
and Final
Environmental Impact Statement
for Revisions to the National Emission
Standards for Mercury

Prepared by:

Jack R Farmer — 3/19/87

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Research Triangle Park, North Carolina 27711

(Date)

1. The promulgated revisions to the national emission standards for mercury would add monitoring, recordkeeping, and reporting requirements for mercury-cell chlor-alkali plants. The promulgated standards implement Section 112 of the Clean Air Act and are based on the Administrator's determination that mercury presents a significant risk to human health as a result of air emissions from one or more stationary source categories and is, therefore, a hazardous air pollutant.

2. Copies of this document have been sent to the following Federal Departments: Labor, Health and Human Services, Defense, Transportation, Agriculture, Commerce, Interior, and Energy; the National Science Foundation; the Council on Environmental Quality; State and Territorial Air Pollution Program Administrators; EPA Regional Administrators; Local Air Pollution Control Officials; Office of Management and Budget; and other interested parties.

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1.0 SUMMARY

1.1 INTRODUCTION

On December 26, 1984, the Environmental Protection Agency (EPA) proposed revisions to the national emissions standards for the hazardous air pollutant mercury (49 FR 50146). The revisions were proposed under authority of Section 112 of the Clean Air Act. Public comments on the proposed revisions were requested, and 10 comment letters were received. Eight of the letters were from representatives of the mercury-cell chlor-alkali industry, one letter was from a State health department, and one letter provided joint comments from two environmental organizations. All comments and the Agency's responses to them are summarized in this document. The comments and responses serve as the basis for the changes that have been made to the proposed revisions.

1.2 SUMMARY OF MAJOR CHANGES SINCE PROPOSAL

One major change has been made to the recommended revisions since proposal. This change is the addition of an alternative means of complying with the monitoring requirements for mercury-cell chlor-alkali plants. The standards now allow the source owner or operator to develop and submit for the Administrator's approval a site-specific monitoring plan for monitoring, recording, and reporting emissions from the hydrogen and end-box ventilation streams. To be approved, an alternative monitoring plan must adhere to the guidelines provided and must ensure not only compliance with the emission limits but also proper operation and maintenance of the emissions control systems.

1.3 SUMMARY OF IMPACTS OF PROMULGATED ACTION

1.3.1 Environmental Impacts of the Promulgated Action

The promulgated action includes monitoring, recordkeeping, and reporting requirements for mercury-cell chlor-alkali plants. The primary purpose of these requirements is to encourage plant owners or operators to adopt the best practices for operating and maintaining process equipment and control devices. While emission reductions are anticipated to occur as a result of better control system practices, no emission reduction impact has been quantified. Implementation of these requirements will not result in any adverse solid waste or water impact.

1.3.2 Energy and Economic Impacts of the Promulgated Action

There are no adverse energy impacts associated with the promulgated revisions. For plants not electing to file site-specific monitoring plans, there will be an average yearly cost of approximately $9,000 per plant during the first three years that the revisions are in effect. For plants electing to submit site-specific plans, the cost is expected to be considerably less. These costs would not result in significantly adverse economic impacts.

2.0 SUMMARY OF PUBLIC COMMENTS

This document includes responses to all public comments received on the revisions to the standards that were proposed on December 26, 1984. A list of the nine commenters, their affiliations, and the EPA docket numbers assigned to their correspondence is provided on page 2-2.

For the purpose of orderly presentation, the comments have been categorized under the following topics:

1. Monitoring Requirements
2. Recordkeeping Requirements
3. Reporting Requirements
4. Indirect Exposures to Mercury
5. Unregulated Source Categories
6. Miscellaneous Comments

The comments and responses to each comment are presented in the following sections of this document.

LIST OF COMMENTERS ON PROPOSED REVISIONS TO THE MERCURY STANDARDS

Docket item number[a]	Commenter and Affiliation
IV-D-1	Mr. George P. Ferreri Air Management Administration State of Maryland Dept. of Health and Mental Hygiene 201 W. Preston St. Baltimore, MD 21201
IV-D-2	Mr. Michael R. Foresman Monsanto Industrial Chemicals Co. 800 N. Lindbergh Blvd. St. Louis, MO 63167
IV-D-3	Mr. Don P. DeNoon LCP Chemicals & Plastics, Inc. Raritan Plaza II CN #3106 Edison, NJ 08818
IV-D-4	Mr. P. N. Tobia Vulcan Chemicals P. O. Box 161 Port Edwards, WI 54469
IV-D-5	Mr. David Vaughn Olin Chemicals P. O. Box 248 Charleston, TN 37310
IV-D-6	Mr. James W. Call Stauffer Chemical Co. Westport, CT 06881
IV-D-7	Mr. Richard J. Samelson PPG Industries, Inc. One PPG Place Pittsburgh, PA 15272
IV-D-8	Mr. Edmund J. Laubusch The Chlorine Institute, Inc. 70 West 40th St. New York, NY 10018
IV-D-9	Mr. L. K. Arehart Diamond Shamrock Corporation 717 North Harwood St. Dallas, TX 75201

LIST OF COMMENTERS ON PROPOSED REVISIONS TO THE MERCURY STANDARDS (con't)

Docket item number	Commenter and Affiliation
IV-D-10	Mr. David D. Doniger Natural Resources Defense Council, Inc. 1350 New York Avenue, N.W. Washington, D.C. 20005 and Environmental Defense Fund 1525 18th Street, N.W. Washington, D.C. 20036

[a]The docket number for this project is A-82-41. Dockets are on file at EPA's Central Docket Section (LE-131), West Tower Lobby; Gallery 1, Waterside Mall, 401 M Street, S.W., Washington, D.C. 20460

2.1 MONITORING REQUIREMENTS

Comment:

Several commenters believed the standards should allow submittal (to the Administrator) of plant-specific compliance plans as an alternative to the proposed monitoring requirements. In support of this alternative, one commenter (IV-D-2) stated that the parameters listed in the proposed revisions would not be appropriate indicators of mercury removal efforts at one of his company's facilities. He provided examples to indicate that other parameters such as the concentration of mercury in the treated hydrogen stream would be better indicators of compliance at that facility.

Commenter IV-D-7 said that both mercury-cell chlor-alkali plants operated by his company employ the hydrogen stream for production of ammonia rather than venting or burning the stream. He stated that these plants maintain mercury levels in the hydrogen stream far below the amounts required by the standards. For this reason, the commenter believed that additional monitoring of this stream was not necessary.

Commenter IV-D-8 stated that in many plants redundant, back-up control equipment has been installed to ensure compliance and that, as a result, several monitored parameters could be exceeded for long periods wihout emissions exceeding the limits of the standards. This commenter believed that in such cases the standards should not require that all parameters be monitored. This commenter believed site-specific conditions should determine the parameters to be monitored.

Commenter IV-D-5 also stated that only one significant control factor should be used for monitoring and reporting purposes. He stated that the outlet temperature of the final cooling unit on the primary cooling system

is the appropriate parameter for plants using cooling systems as the primary mercury removal system (with or without subsequent control systems). Experience at his plant indicated that if the outlet temperature of the gas stream from the final cooler is maintained at a proper temperature then compliance with the emission standard is assured. If, on the other hand, the outlet temperature increases significantly for an extended period of time, elevated emissions may be experienced with or without downstream control equipment.

Commenter IV-D-4 stated that hourly monitoring of parameters was not necessary at all plants. His plant had designed and installed extra abatement equipment with performance such that upsets, including a total scrubber bypass, of several hours duration would not result in an exceedance of the 1,000 grams per day emission limit for the hydrogen and end-box ventilation streams. He recommended that the monitoring frequency be established on a site-specific basis, related to the amount of time that could elapse during a control system failure before the emission limit would be exceeded.

A second commenter (IV-D-7) also believed hourly monitoring was unnecessary since a complete failure of control equipment would rarely, in his opinion, result in an emissions violation within a one-hour period. He further stated that, in many cases, redundant control equipment is installed in series so that failure of one item of equipment does not necessarily indicate a violation of the standard. Because each control system at each plant is different, this commenter believed that testing and reporting schemes should be plant specific and that the preamble should describe the frequency of monitoring that would be appropriate

relative to the length of time which is critical for compliance. As an example, the commenter suggested that recording of a parameter which could cause an excursion after no less than 12 hours would need to occur only once per four-hour period.

Response:

The monitoring requirements that were proposed were intended to serve two purposes: to ensure compliance with the emission limits of the standards and to ensure proper operation and maintenance of the emission reduction system(s). The Agency recognizes that some of the mercury-cell chlor-alkali plants operate at emission levels well below the limits of the standards. However, the Administrator believes that sound environmental policy dictates that emission control systems, installed to reduce emissions to meet Federal health standards, should be operated and maintained properly on a continuous basis even if such systems can be operated improperly and still comply with the emission limits. As indicators of proper operation and maintenance, the monitoring requirements are considered important elements of the standards and are being maintained in the final standards.

However, the Agency recognizes, based on the comments received, that additional monitoring options may be necessary to ensure that the parameter(s) being monitored is the most appropriate one. To achieve this purpose, the Agency has added a provision to the regulation that allows individual plant owners or operators to develop site-specific monitoring plans and submit them to the Administrator for approval. These plans must assure proper operation and maintenance of the emission reduction system as well as compliance with the emission limits. For this reason, the plans are not to be considered as compliance plans (as stated in the comments) but as

alternative monitoring plans. It should be noted that owners or operators are not required to submit site-specific plans. Submittal of such plans, followed by adherence to the approved monitoring procedures, is being provided as an alternative to meeting the monitoring requirements of the standards.

If alternative monitoring plans are submitted for approval, they must, at a minimum, include the following:

1. Identification of the critical parameter or parameters for the hydrogen stream and for the end-box ventilation stream that are to be monitored and an explanation of why the critical parameter(s) is the best indicator of proper control system performance and of mercury emission rates.

2. Identification of the maximum or minimum value of each parameter (e.g., degrees temperature, concentration of mercury) that is not to be exceeded. The level(s) is to be directly correlated to the results of a recent performance test when the facility was in compliance with the emission limits of the standards.

3. Designation of the monitoring/recording frequency, with justification if the frequency is less than hourly. The monitoring/recording frequency must be justified on the basis of the amount of time that could elapse during periods of process or control system upsets before the emission limits would be exceeded, and consideration is to be given to the time that would be necessary to repair the failure. For example, if emissions could exceed the limits of the standards within 8 hours of a control system failure and the repairs would typically require 2 hours, then by-hourly monitoring may be appropriate on shifts when repairs can be assured within two hours. If, however, maintenance

and repair technicians are not available until the next shift, or the repairs may require 6 hours to complete, then nothing short of hourly monitoring would appear to be appropriate.

4. Designation of the immediate actions to be taken in the event of an excursion beyond the level of the parameter identified in 3.

5. Provisions for reporting, semiannually, parameter excursions and the corrective actions taken, and provisions for reporting, within 10 days, any significant excursion.

6. Identification of the accuracy of the monitoring device(s) or of the readings obtained.

7. Recordkeeping requirements for certifications and calibrations.

The Agency believes that, once approved, alternative monitoring plans that include all of the above information would be appropriate indicators of compliance and of proper operation and maintenance and that the option to submit alternative plans provides the flexiblity sought by the commenters.

Comment:

One commenter (IV-D-6) said that the average regeneration temperature for a molecular sieve was not the appropriate temperature to monitor during the performance test. He stated that a better indicator of the effectiveness of bed regeneration would be the maximum temperature reached during the heating cycle. He suggested that EPA establish a temperature level that must be reached during the heating cycle.

Response:

The Administrator has accepted the commenter's statement that the average regeneration temperature is not as good an indicator of regeneration effectiveness as the maximum temperature reached during the heating cycle. Thus, the monitoring requirement has been changed to require measuring/recording

of the maximum temperature reached during desorption, i.e., the heating cycle. After the reference temperature is recorded, the owner or operator is required to record the maximum temperature reached during each subsequent heating cycle. Failure to reach the reference temperature during any future heating cycle will be considered improper operation and maintenance of the molecular sieve.

Comment:

Commenters IV-D-5 and IV-D-7 said that the need for additional monitoring and reporting requirements had not been demonstrated. Commenter IV-D-5 cited a statement made in the preamble to the proposed revisions that all mercury-cell chlor-alkali plants are presently in compliance with the NESHAP for mercury. He also stated that the Agency did not indicate any specific problems in maintaining compliance. This commenter believed additional monitoring and reporting requirements are unnecessary. Commenter IV-D-7 said that no evidence was presented to show that a reduction in emissions would result from implementing the proposed changes.

Response:

While compliance with the NESHAP has been demonstrated (by a performance test) at least once in the past at each of the mercury-cell chlor-alkali plants, information that the Agency received prior to proposal of the revisions indicated that (1) some plants had experienced problems with controlling mercury emissions from the hydrogen stream, and (2) some facilities emit at levels just below the emission limits so that exceedances of the emission limits are likely to occur during process or control system upsets at these plants. Monitoring requirements were proposed, in part, to prevent such exceedances. It is the Agency's belief that careful monitoring of the process and control system(s) is necessary to

alert owners/operators of problems in time to correct them before the emission limits are exceeded. In addition to assuring compliance, monitoring requirements also serve to ensure that control systems are properly operated and maintained on a continuous basis. (See response to earlier comment in this section.)

The emission reduction to be gained from the addition of monitoring requirements could not be quantified since the Agency did not have sufficient information on the number of preventable exceedances that have occurred in the past or on the emission levels that could have been reduced by better operation of the control system. Without monitoring and reporting requirements, such information is rarely available. However, since problems with controlling mercury emissions from the hydrogen stream have been encountered and because the Agency believes that monitoring requirements will result in earlier knowledge and repair of problems, the Agency believes that there will be further emission reductions as a result of the monitoring and reporting requirements.

Comment:

Commenter IV-D-6 asked if new values for operating parameters could be established when changes in plant operations take place that affect the values of the monitored parameters (provided that the new values are established on the basis of a new performance test and that proper notification of the test and of the intent to revise parameter values is given).

Response:

New values for monitored parameters (either process or emission control system parameters) may be established when changes in plant operations take place that affect the values established previously. As the

commenter assumed, such new values would have to be based on values measured during a performance test conducted under the new operating conditions. As with all performance tests, at least 30 days' prior notice of the test is required.

Comment:

Commenter IV-D-7 questioned the usefulness to enforcement personnel of the monitoring program being required. He commented that the proposed control program requires deliberate detuning of emissions equipment during testing to establish a worst-case baseline followed by frequent monitoring and reporting of parameters which exceed those values established during testing. He questioned how enforcement personnel would use the information to determine if additional emission tests are necessary.

Response:

The reason for allowing plant owners or operators to conduct performance tests under the upper range of operating conditions that can reasonably be expected to occur under normal operating conditions is to minimize the reporting burden while maintaining the purpose of the monitoring requirements (which is to ensure proper operation and maintenance of emission control systems). The standards do not require detuning of emissions control equipment during testing; in fact, detuning is not allowed. The test may be conducted under conditions expected to provide the highest values of the monitored parameters (or, in the case of chemical absorption systems, lowest values) that could be expected to occur under conditions of proper operation and maintenance. Thus, while a test may be conducted during the summer when ambient cooling waters would approximate the highest temperature readings that are expected to

occur, the test must still be conducted under normal operating conditions with all control systems functioning properly.

Because the acceptable levels of monitored parameters would be established near the highest (or, where appropriate, the lowest) value expected to occur while the facility is in compliance, any exceedance beyond these levels would indicate to enforcement personnel that there are problems with the emission control systems. Based on the extent of the excursion and its duration, enforcement personnel would have an indication of whether the emission limits are being exceeded. If there is reason to believe that the limits are being exceeded, a performance test could be required to establish compliance status.

Comment:

Commenter IV-D-7 stated that testing to establish the proper "baseline condition" could be costly. He believed that an owner or operator would attempt to establish test conditions at a "barely pass" level to avoid future reporting. In his opinion as many as 10 tests might be conducted (at $12,000 per test) to establish the "barely pass" conditions. Further, he suggested that the phrase "other than conditions of malfunction" be deleted from the preamble discussion of "testing under the upper range of operating conditions (other than conditions of malfunctions) that can reasonably be expected to occur on a routine basis." (49 FR 50150) He believed that malfunction conditions are undefined, and, consequently, insignificant deviations from normal operations may be interpreted as malfunctions.

Response:

As stated in the response to the previous comment, the Agency allows testing under the upper range of operating conditions that can reasonably

be expected to occur given conditions of proper operation and maintenance. The phrase "other than conditions of malfunctions" is intended to clarify that the test conditions must be representative of proper operation and maintenance. The phrase is necessary to prevent detuning of control systems (see previous comment) or any kind of change to the system that is not representative of proper operation. For this reason, the phrase is necessary and has not been deleted.

The standards do not require repetitions of the performance test to achieve "barely pass" conditions, nor was the provision that is the subject of the comment intended to encourage such repetitions. Only one performance test is required under the proposed revisions. Conducting performance tests would be costly only if the plant owner or operator elected to repeat them.

Comment:

Commenter IV-D-6 stated that it was not feasible to conduct continuous stack testing during the entire six-hour (minimum) period of the performance test.

Response:

The standards require the completion of one performance test to use as a basis for establishing the limits for parameters to be monitored. The performance test result is the average of the results of 3 individual repetitions of the test methods. Each of these 3 sample runs should last a minimum of 2 hours (See Section 7.1.2 of Method 101), thus yielding a minimum total sampling time of 6 hours. However, continuous stack testing during any consecutive 6-hour clock period is not required by the reference methods. The three sample runs should be conducted over a period or periods that accurately reflect the maximum emissions that occur in a 24-hour period, but these periods need not be consecutive.

The commenter was contacted to ascertain if there would be problems conducting stack tests according to the procedure outlined above. He indicated that the procedures, as described, would not present a problem.

2.2 RECORDKEEPING REQUIREMENTS

Comment:

Several of the commenters believed that the requirement to record all incidences of mercury leaks or spills should be changed to require recording only incidences of unpredictable leaks or spills. Commenters IV-D-3, IV-D-5, and IV-D-8 stated that predictable events such as those that occur during routine maintenance should be excluded since clean-up procedures are designated for these types of leaks or spills. These commenters believed that only unpredictable leaks/spills that require immediate corrective actions should be reported.

Commenter IV-D-6 suggested that criteria for determining "significant" leaks/spills be established to define those leaks/spills that should be recorded. Shift personnel at his company's plants do not formally document their observations unless the leaks/spills are significant and require immediate corrective action. No definition of "significant" was offered by the commenter.

Response:

The EPA agrees that "significant" leaks are the type of leak/spill that is of interest to the Agency. However, the Agency is unable to define levels of parameters (e.g., quantity, volume, duration) that would constitute a "significant" leak or spill. In a meeting with representatives from several companies that own or operate mercury-cell chlor-alkali plants (February 28, 1984; see docket entry II-D-61), EPA asked these industry representatives for their suggestions of ways to define significant leaks or spills. No definition of "significant" could be suggested.

Instead, these industry representatives indicated that predictable leaks/spills should be excluded from the recordkeeping requirements. However, in the Agency's opinion, there could be predictable leaks/spills that, due to their number or quantity, would be "significant" in that they could cause an exceedance of the emission limit if not corrected immediately. The EPA is unaware of any definite relationship between a leak or spill's predictability and its significance. Also, subjective opinions about what is predictable are likely to vary from plant to plant so that some plants would record certain leaks/spills while another plant would not. For these reasons, the commenters' suggestion could not be adopted.

In the February 28, 1984, meeting referred to earlier, mercury-cell chlor-alkali plant representatives gave EPA the impression that leaks and spills of any magnitude were infrequent occurrences if the cell room were operated properly. However, based on the written comments received, the Agency is concerned that leaks, labeled as predictable, may occur on a somewhat frequent basis and that sufficient steps may not be taken to avoid such occurrences in the future. Because of the hazardous health effects of mercury, it seems to EPA that a plant owner/operator would want to be informed of any mercury leaks or spills that occur and of the corrective actions taken not only to clean up the spill but to ensure that future leaks or spills are avoided as much as possible.

The Administrator believes it is appropriate to record all leaks or spills on a daily basis and to record the corrective actions that were taken. With such records available, company and enforcement personnel can review the history of mercury leaks/spills at a specific plant and determine if corrective actions have been timely and appropriate to avoid

recurrent leaks/spills of the same type. Thus, the requirement for daily recording of all mercury leaks/spills has not been changed.

2.3 REPORTING REQUIREMENTS

Comment:

One commenter (IV-D-5) believed that reporting incidences when a monitored parameter is not within the range established by the performance test should be required on an annual basis rather than on a semiannual basis.

Response:

Failure to maintain process or control device parameters within acceptable ranges established by a site-specific performance test constitutes a failure to operate and maintain equipment properly so as to prevent exceedances of the emission limits. Enforcement personnel need to know, as early as possible, about such failures so that they can work with plant personnel to correct the situation as early as possible. Considering that failure to maintain the equipment within acceptable ranges that were established during a performance test conducted under worst-case conditions could lead to exceedances of the emission limit, the Administrator believes it is prudent to require, on a frequent basis, reports of periods when the systems are not operating properly. Semiannual reporting is judged to be reasonable for these purposes.

It should be emphasized that no reports are required at all if the equipment is operated and maintained so as to remain within the specified acceptable ranges.

Comment:

Two commenters (IV-D-7 and IV-D-8) stated that reporting failures to maintain process or control system parameters within site-specific acceptable

ranges for periods exceeding 24 hours in duration need not be required within 10 days of the failure. These commenters believed that the requirement is redundant, since parameter excursions would be reported again as part of the semiannual reports, and creates an unnecessary paperwork burden on the regulated facilities.

Response:

The semiannual reporting period is believed to be appropriate for reporting infrequent or unprolonged failures to operate equipment within those site-specific ranges established during the performance test. However, excursions beyond these ranges that are not corrected within 24 hours could represent major equipment failures with increased risk of exceeding the emission limit of the standard. For this reason, enforcement personnel need to know about prolonged excursions and the corrective actions taken to correct them as quickly as possible. Reporting such information within 10 days is considered the maximum reasonable amount of time to delay the report of prolonged excursions but sufficiently long for the operator to be able to report steps that were taken to fully correct the problem.

In this way, enforcement personnel are made aware of potentially significant equipment failures and attempts to correct them in a timely manner so that they can evaluate the efficacy of the corrective actions and determine whether the potential exists for a significant exposure risk. For these reasons the Administrator believes that prolonged excursions need to be reported in as timely a manner as possible. The relevant semiannual report would include a copy of the earlier report as well as a description of any additional excursions. The paperwork burden associated with 10-day reports is estimated to be less than 5 manhours per report.

This burden is not viewed as unnecessary or unreasonable in light of the potential emission exceedances that may be prevented as a result of the reports. As noted previously, it should be emphasized that no 10-day reports would be required at all if the equipment is operated and maintained so as to remain within the specified acceptable ranges.

Comment:

Commenter IV-D-5 said that the sentence in the preamble stating that 24 hours should be sufficient time to repair most conditions causing parameter excursions is true for most conditions but is not true for equipment malfunctions requiring major repair or replacement. In these instances, repairs could require several days.

Response:

The sentence referred to by the commenter related to the consecutive 24-hour period being allowed for hourly parameter excursions before the owner/operator is required to report the excursions within a 10-day period. Available information indicates that the majority of control system upsets can be repaired and the parameters returned to acceptable limits within 24-hours. By requiring reports within 10 days of only those hourly parameter excursions that continue for extended period (24 hours or more) owners or operators do not have to report periods of excursions that are repaired within a few hours, bringing the parameters back within acceptable levels. However, periods of parameter excursions that continue for prolonged periods (24 hours or more) indicate significant control system failures that are of interest to enforcement personnel. Therefore, the standards require reports of such extended excursions to be filed early enough for enforcement personnel to assess the corrective actions being taken. The Agency

recognizes that some equipment failures may require more than 24 hours to repair, and it is these failures that are of primary concern.

Comment:

Three commenters (IV-D-4, IV-D-5, and IV-D-8) asked that the Agency describe in the standards the purpose of reports of incidences of excursions of process or control system parameters and the way that enforcement personnel would use such reports. The commenter believed such a description would help ensure that parameter excursions would not be misconstrued as exceedances of the emission limits. Another commenter (IV-D-3) asked if there will be penalties for reporting excursions of control device parameters.

Response:

Failure to operate process or control system parameters within acceptable ranges (as determined by site-specific performance tests) constitutes a failure to operate and maintain control systems properly. Such failures do not constitute a violation of the emission limits; noncompliance with the emission limits of this standard can be determined only on the basis of a performance test. Thus, plant owners or operators cannot be cited or otherwise penalized for noncompliance with the emission limits based on reports of parameter excursions. However, enforcement personnel could issue a violation based on improper operation and maintenance and could require a performance test to establish compliance with the emission limits.

Section 61.55(b) of the regulation has been revised to clarify that parameter excursions will be considered unacceptable operation and maintenance of the facility but that such excursions cannot, by themselves, be interpreted as exceedances of the emission limits.

Comment:

Two commenters (IV-D-6 and IV-D-7) believed that the period for filing reports of performance tests should be extended from 15 days following receipt of the test results to 30 days (IV-D-6) or 60 days (IV-D-7). This additional time would allow such owners or operators to verify the validity of the test data and, if errors are suspected, to resample and retest. Commenter IV-D-7 stated that an operator may conduct up to 10 tests in an attempt to establish test conditions at a "barely pass" level to avoid future reporting of parameter excursions. He believed the resulting testing and analytical load is sufficient to delay the report of the test results by 60 days.

Response:

Prior to proposal of revisions to the standards, the mercury NESHAP allowed only one day, following receipt of test results, to report the results to the Administrator. Because one day was considered insufficient time for the source owner/operator to review the results and verify their validity, an additional two week period was proposed. This period is believed sufficient to review the results before forwarding them to the Administrator. If repeated tests are subsequently conducted and the owner/operator wants these results to supercede the first test results, then the results of these tests would also be submitted to the Administrator within 15 days following the date that the results are known. The extension is not intended to provide additional time for repeating tests. All test results should be reported, and the owner or operator is being provided only the time believed necessary to review the results before reporting them, to identify any errors. For, this reason, the 15-day period is not being revised.

2.4 INDIRECT EXPOSURES TO MERCURY

Comment: Commenter IV-D-10 stated that the 1.0 $\mu g/m^3$ ambient air guideline is based exclusively on the toxicity of inhaled mercury and ignores the health effects resulting from indirect exposures to mercury. He stated that atmospheric mercury emissions are deposited on land, water, and other surfaces, and that the deposited mercury may be transformed into methylated mercury, the most toxic form of mercury. The commenter believed that the Agency failed to assess all means through which mercury can endanger public health and thus failed to meet its Clean Air Act mandate to consider all sources of exposure to the pollutant in determining health risk. The Agency also did not draw any conclusion as to how methylation processes increase the health risk from emissions of metallic and inorganic mercury.

This commenter also stated that little attention was paid to background mercury levels in humans and in the ecosystem in evaluating the hazards of incremental increases resulting from uncontrolled emissions sources. The commenter believed that EPA must evaluate the risks associated with ongoing industrial activities over and above background levels resulting from previous activities. He believed that the marginal contribution of some current sources may be relatively small, but for certain populations, such as fish eaters in the Great Lakes region, the incremental exposure could be significant.

The commenter believed that EPA must fully evaluate the risk from indirect exposures to mercury and then re-evaluate the adequacy of the standard for each currently regulated category as well as the Agency's decisions not to set standards for other categories. Only after such evaluation will EPA meet its statutory duty to review and, if necessary, revise the mercury standard.

Response:

While the ambient air guideline of 1.0 µg/m^3 is based primarily on the toxicity of inhaled mercury (Hg), the Agency did not ignore the effects resulting from indirect exposure to mecury in developing the ambient air guideline. To determine the ambient air level of mercury that did not impair human health, the impact of the airborne burden (inhalation of mercury vapor) was considered in conjunction with the water and food burdens (ingestion of methyl mercury). This analysis assumes that exposures to methyl mercury (diet/ingestion) and mercury vapor (inhalation) are equivalent and additive. The prolonged intake level of the most hazardous form of mercury was used to develop the inhalation guideline. This level (approximately 300 µg Hg as methyl mercury/day/70 Kg body weight) was based on the occurrence of the first symptoms of mercury intoxication, i.e., non-specific symptoms such as paresthesia. A safety factor of ten (30 µg Hg/day) was added to provide protection against genetic lesions and effects in children and the fetus. The mercury intake level for inhalation (20 µg Hg/day/70 Kg adult) used in developing the standard considered the impact of the average intake level from the ingestion of mercury (10 µg Hg/day).

An average dietary intake level of 10 µg Hg/day/adult was used to assess the impact of indirect mercury exposure from the ingestion of food. This intake level is well above the 2.9 to 3.9 µg Hg/day average adult intake from the ingestion of food as reported in the current Food and Drug Administration's (FDA) Revised Total Diet Study. The current intake levels are based on data obtained from the eight revised market baskets collected during the period April 1982 through March 1984 (Docket item IV-D-17). The FDA tests foods throughout the United States to estimate levels of mercury

and other trace materials. A review of mercury dietary intake levels for the foods tested by FDA for the period 1973 to 1982 indicate average mercury levels in foods are not significantly increasing [ranging from 2 µg Hg/day for Fiscal Year (FY) 1974 to 7 µg Hg/day for FY 1976 and back to 3 µg Hg/day for FY 1981/82] and are below the 10 µg Hg/day intake level used in the NESHAP analysis to represent indirect exposures. While the Agency does not continuously assess the background levels of mercury in humans, the FDA does continuously monitor the mercury levels in food through its Revised Total Diet Study to provide an indication of changes in the dietary intake levels of the general public.

The effects of atmospheric mercury on other environments such as drinking water and the accumulation of methyl mercury in food (primarily fish) were not fully addressed in the NESHAP review. As a result of the acid rain issue, the Agency is presently reviewing available information concerning these effects, and studies are currently underway to gather necessary data. These include studies of biochemical mechanisms (for example, the biochemical cycling of mercury) and health and environmental effects (for example, the bioaccumulation of methylmercury in fish) from the deposition of mercury. A preliminary report of the results of studies addressing the bioaccumulation of mercury in fish (the primary source of ingested mercury) is scheduled for 1989 with an integrated report on mercury bioaccumulation scheduled for 1992. As the results of these studies become available, the Agency will take action as appropriate. However, at this time, the Agency does not have a sufficient basis for revising the 1.0 ug/m^3 ambient guideline level.

Comment:

Commenter IV-D-5 responded to the Agency's request (49 FR 50147) for comments on the effects of indirect exposures to mercury by stating that he believed that no information has been developed which indicated that indirect exposures to mercury have a significant impact on health or on the environment. He believed that the 1.0 $\mu g/m^3$ ambient guideline is amply protective and should not be changed.

Response:

Please see response to previous comment.

2.5 UNREGULATED SOURCE CATEGORIES

2.5.1 COAL COMBUSTION

Comment:

Commenter IV-D-10 believed that further analysis of mercury emissions from coal-fired power plants was necessary. He stated that the Agency must analyze the health risk associated with deposited mercury emisions from coal combustion on a national basis and on a regional, or even plant-specific, basis for coals with high mercury content. The commenter referred to reports of mercury concentrations in some American coals as high as 1.6 parts per million (ppm), a level four times higher than the concentation that was used in the Agency's analysis. He stated that the Agency cannot conclude that the ambient guideline will not be exceeded until an analysis of the ambient concentrations expected from plants burning high-mercury coals is completed.

The commenter also objected to EPA's "piecemeal" approach to regulating toxic emissions from coal-fired boilers. By analyzing toxic components of boiler emissions one-by-one, there is a strong bias against control since only a fraction of the total health risk is compared with the total control cost. The commenter believed that EPA should abandon this approach and should require the use of particulate control techniques to capture all toxic emissions, including mercury.

Response:

To examine the potential for mercury emissions from coal-fired power plants to exceed the ambient air guideline, the Agency reviewed the data on the mercury content of coals available in the United States (Docket item IV-B-1). The highest mercury level reported for the 48 contiguous states is 8 parts per million (ppm) for subbituminous coal (640 samples) and 3.3 ppm for bituminous coal (3527 samples) with an average of 0.1 ppm

for subbituminous coal and 0.21 ppm for bituminous coal. The worst case estimates for a large 4000 megawatt (MW) coal-fired power plant firing 8 ppm subbituminous coal is 870 pounds of mercury per day. According to dispersion estimates, a 4000 MW plant emitting 790 pounds of mercury per day would cause a maximum ground level concentration of 1.0 $\mu g/m^3$. This indicates that in the extreme case a large coal-fired power plant could emit mercury at levels high enough to exceed the ambient guideline. However, typically, mercury emissions from coal-fired power plants are expected to be well below the ambient guideline level.

The Agency is currently studying the combined effect of identified trace element (including mercury) emissions from fossil fuel combustion. For mercury, estimates are being made of nationwide emissions and of maximum concentrations associated with four sectors of coal burning: utility, industrial, commercial, and residential combustors. The results of this study will be used to determine the need and appropriate mechanism for regulating mercury emissions from fossil-fuel combustion.

2.5.2 OIL SHALE RETORTS

Comment:

Commenter IV-D-10 stated that there are data indicating that mercury emissions from oil shale retort operations can equal or exceed emissions from the currently regulated source categories. He believed these data demonstrate the need to set a national emission standard for mercury emissions from oil shale retorting and to examine the potential for mercury emissions from other synthetic fuel processes that are under active consideration.

Response:

At the present time there is only one retort plant in operation in the United States that is capable of processing more than 100 tons per day of raw shale to produce crude oil. Estimates of mercury emissions from this operation indicate that ambient mercury levels would be less than 0.04 $\mu g/m^3$, a level well below the ambient guideline level of 1.0 $\mu g/m^3$ (Docket item IV-B-2).

Construction of new retort operations or startup of existing plants that have been shut down is not anticipated in the near future. Furthermore, projections of mercury emissions from hypothetical commercial-scale operations indicate that emissions from a large size facility would still be below the ambient guideline level (Docket item IV-B-2).

In view of the low level of emissions from the oil shale retort that is currently in operation and the lack of anticipated growth in this industry in the near future, oil shale retorting operations are not being added as a source category to be regulated by the current mercury NESHAP. If oil shale retort operations become economically feasible, the Agency will review its decision not to regulate mercury emissions from these operations under these standards.

2.6 MISCELLANEOUS COMMENTS

Comment:

Commenter IV-D-6 stated that his company's initial estimates of the annual cost to comply with the proposed revisions indicate that the Agency's estimate of $9,000 may be low.

Response:

The commenter was contacted to obtain a copy of his company's estimates for comparison purposes. The commenter indicated that his company's initial estimates indicated costs may be slightly higher than EPA's estimate (around $10-12,000 instead of $9,000) but that the difference was, in his opinion, not large enough to pursue comparing the estimates. Thus, the Agency's number has not been revised.